Charles M. Brendecke, Ph.D.,P.E.

Principal

Professional summary

Dr. Brendecke has more than 35 years of diverse experience in hydrology, water resources engineering, and water resources planning and management. He has directed or contributed to several river-basin water management studies that involved detailed inventories of basin hydrology and water demands, as well as development of planning models to investigate implications of reservoir systems operations and growth in basin water demands. Several of these studies involved instream flow and endangered species issues. His work as the project manager and lead expert in a variety of water rights proceedings includes historical consumptive use analysis, evaluation of surface/groundwater interactions, stream depletion analysis, development of protective terms and conditions, settlement negotiations, and expert witness testimony. He has been qualified as an expert witness in numerous venues, including the U.S. Supreme Court.

Professional Qualifications

Professional Engineer (PE), CO #17578, WY #6960, OK #21265, ID #11896

Education

Ph.D., Civil Engineering, Stanford University, 1979.

M.S., Civil Engineering, Stanford University, 1976.

B.S., Civil Engineering, University of Colorado, 1971.

Public Policy Mediation Training – CDR Associates, 2004.

Memberships

American Society of Civil Engineers

American Water Resources Association

American Geophysical Union

Languages

English

Location

Boulder, Colorado

Summary of core skills

Hydrology; Water rights; Water supply planning /management; Surface/ground water interaction; Reservoir system operations; computer modeling; Statistical hydrology; Negotiation/litigation support; Expert witness testimony.

Employment History

2007-2008	Principal, AMEC's Earth & Environmental Division. Responsible for management of engineering studies, consultant on water rights and water resources planning projects, expert witness testimony.
1986-2007	Principal and President (1990 to 2007), Hydrosphere Resource Consultants, Inc. Responsible for management of engineering studies, company development and management, consultant on water rights and water resources planning projects.
1985-1986	Senior Project Engineer, Wright Water Engineers Inc. Responsible for engineering analysis and report preparation on water rights and hydrologic studies.
1979-1985	Assistant Professor of Civil Engineering, University of Colorado. Responsible for teaching and research in areas of water resources and systems analysis.
	Faculty Research Associate, Institute for Arctic and Alpine Research. Directed various research studies in alpine hydrology and meteorology.
	Consultant, U.S. Army Corps of Engineers; Western Environmental Analysts, Inc.; Dietze & Davis, P.C.; Copper Mountain, Inc.; Hydrologic Consulting Engineers, Inc.; Westfork Investments, Ltd.
1975-1979	Research Assistant and Lecturer, Stanford University. Responsible for conducting research and lecturing for undergraduate courses in civil engineering.
1973-1975	Design Engineer, Wright-McLaughlin Engineers, Inc. Performed engineering design of water supply and wastewater collection systems.

Publications

Brendecke, C., 2004, "Toward Conjunctive Management of the Eastern Snake Plain Aquifer," poster presentation at Natural Resources Law Center 25th Summer Conference Groundwater in the West, June 16-18, Boulder, CO.

Brendecke, C., 2004, "Interstate Water Conflict: Compacts, Adjudications and Decrees," presentation at Water Policy Seminar: Freshwater Conflicts in the United States, May 19, Stanford, CA.

Brendecke, C., and R.D.Tenney, 2001, "Water Rights, Compact Entitlements and Endangered Fishes of the Yampa River Basin," Proceedings of the Annual Water Resources Conference, American Water Resources Association, November 12-15, Albuquerque, NM.

Brendecke, Charles M., 2001, "Conjunctive Management: Science or Fiction?" presentation to Idaho Water Users Association 18th Annual Water Law and Resource Issues Seminar, November 8-9, Boise, ID.

Tenney, Ray D., and C.M. Brendecke, 1998, "Planning for Water Development and Endangered Species Recovery in the Yampa River Basin." Proceedings of the Wetlands Engineering & River Restoration Conference, 1998, American Society of Civil Engineers, March 26th, 1998, Denver, CO.

Payton, E., C. Brendecke, B. Harding, E. Armbruster, T. McGuckin and C. Huntley. 1997. "Agricultural Water Conservation Planning & Pricing-Tools & Technologies." Proceedings of the Irrigation Association's 18th International Conference, Nov. 2, 1997, Nashville, TN.

Hydrosphere Resource Consultants, Inc., 1996, "Achieving Efficient Water Management: Agricultural Water Conservation Planning," workshop for U.S. Bureau of Reclamation staff, Dec. 16 - 18, Las Vegas, NV.

Brendecke, C., B. Harding and E. Payton, 1996, "PC-Based Decision Support Tools: Lessons from a Dozen Applications," Proceedings of the Fifth Water Resources Operations Management Workshop, Water Resources Planning and Management Division (ASCE). March 4, Arlington, Virginia.

Howe, C.W., M. Smith, L. Bennett, C. Brendecke, J. Flack, R. Hamm, R. Mann, L. Rozaklis, and K. Wunderlich, 1994, "The Value of Water Supply Reliability in Urban Water Systems," Journal of Environmental Economics and Management, 26, 19-30.

Brendecke, C., 1993, "Managing Snake River Operations for Juvenile Salmon Migration," Proceedings of the ASCE Water Resource Planning and Management Conference Division 20th Anniversary Conference, Seattle, Washington, May.

Brendecke, C., 1992, "The Hydrosphere Snake River Operations Model", 9th Annual Water Law and Resource Issues Seminar, Idaho Water Users Association, Boise, Idaho.

Brendecke, C., and B. Harding, 1990, "Logical Intransitivities and Other Administrative Nightmares: Can Models Help?," Proceedings of the 26th Annual AWRA Conference and Symposium, November 4-9, Denver, Colorado.

Harding, B., C. Brendecke, and R. Kerr, 1990, "Legal and Economic Disincentives in the Transfer of Models to Users," Proceedings of the 26th Annual AWRA Conference and Symposium, November 4-9, Denver, Colorado.

Brendecke, C., W. DeOreo, E. Payton, and L. Rozaklis, 1989, "Network Models of Water Rights and System Operations," Journal of the Water Resources Planning and Management Division (ASCE).

Rozaklis, L., E. Payton, C. Brendecke, and B. Harding, 1988, "Modeling Water Allocation Problems Under Complex Hydrologic and Institutional Settings," paper presented at the 24th Annual AWRA Conference and Symposium, November 8, Milwaukee, Wisconsin.

Brendecke, C., W. DeOreo, and L. Rozaklis, 1987, "Water Rights Analysis and System Operation Using Network Optimization Models," paper presented at the 14th Annual ASCE Water Resources Planning and Management Division Conference, March 16-18, Kansas City.

Brendecke, C., E. Payton, and R. Wheeler, 1987, "Network Optimization Models for Water Rights Analysis and System Operating Studies for the City of Boulder," Proceedings of the Colorado Water Engineering and Management Conference, February 17-18, Ft. Collins, Colorado.

Payton, E., and C. Brendecke, 1985, "Rainfall and Snowmelt Frequency in an Alpine Watershed," Proceedings of the 53rd Western Snow Conference, April 16-18, Boulder, Colorado, pp. 25-36.

Brendecke, C., and J. Sweeten, 1985, "A Simulation Model of Boulder's Alpine Water Supply," Proceedings of the 53rd Western Snow Conference, April 16-18, Boulder, Colorado, pp. 63-71.

James, E., and C. Brendecke, 1985, "The Redistribution and Sublimation Loss of Snowpack in an Alpine Watershed," Proceedings of the 53rd Western Snow Conference, April 16-18, Boulder, Colorado, pp.148-151.

Brendecke, C., D. Laiho, and D. Holden, 1985, "Comparison of Two Daily Streamflow Simulation Models of an Alpine Watershed," Journal of Hydrology, 77, pp. 171-186.

Brendecke, C., D. Laiho, and J. Sweeten, 1984, "Management of a Municipally Owned Alpine Watershed Using Continuous Simulation," Proceedings of the 11th International Symposium on Urban Hydrology, Hydraulics, and Sediment Control, July 23-26, Lexington, Kentucky, pp. 79-87.

Lewis, W., D. Crumpacker, J. Saunders, and C. Brendecke, 1984, Eutrophication and Land Use, Ecological Studies Vol. 46, Springer-Verlag, New York, 202 pp.

Brendecke, C., D. Laiho, and D. Holden, 1984, "A Comparative Evaluation of Streamflow Simulation Models in a Colorado Alpine and Subalpine Environment," Proceedings of the American Geophysical Union Front Range Branch Hydrology Days, April 24-26, Ft. Collins, Colorado, pp. 40-55.

Baker, F., and C. Brendecke, 1983, "Seepage from Oilfield Brine Disposal Ponds in Utah," Groundwater, 21(3), pp. 317-324.

Brendecke, C., and L. Ortolano, 1981, "Environmental Considerations in Corps Planning," Water Resources Bulletin, 17(2), pp. 248-254.

Detailed Skills by Representative Project

Conjunctive Administration of Ground Water Rights. Project manager and testifying expert for Idaho Ground Water Appropriators, Inc., in proceedings related to administration of surface and ground water rights. Work has involved oversight of regional ground water model development of the Eastern Snake Plain Aquifer, ground water modeling in support of management and mitigation plans, and analysis of historical water use data.

Rio Grande Basin Confined Aquifer Use Rules. Testifying expert for the State of Colorado regarding the use of the RGDSS ground water model in developing rules governing withdrawals from the confined aquifer system of the San Luis Valley.

Columbia River Basin Reservoir Operations. Project manager for studies of the impact of modified reservoir operations on agricultural interests in the Kootenai River basin.

New Mexico Surface Water Studies. Project manager for a program of surface and ground water studies on the Pecos River in support of State initiatives.

Interstate Compact Litigation. Expert witness in litigation between Kansas and Colorado regarding Arkansas River water uses.

Interstate Compact Litigation. Project manager and expert witness in litigation between Nebraska and Wyoming regarding storage project operations and water deliveries to agricultural users on the North Platte River.

Snake River Water Rights. Project manager for studies of historical irrigation practices and modeling of surface/ground water interaction on the eastern Snake River Plain, Idaho.

Rio Grande Decision Support System. Quality assurance officer on development of comprehensive surface water model of the Rio Grande River basin in Colorado.

Agricultural Water Conservation. Project manager for development of a water conservation guidebook for use by irrigation districts. The guidebook describes planning approaches and methods for evaluating specific conservation measures.

Colorado City Metropolitan District. Project manager for water supply planning studies and water rights litigation support for municipal water provider.

Gunnison Basin Planning Model. Project manager for development of an interactive PC-based computer model of the Gunnison River basin. The model uses a network solution algorithm and incorporates a Windows™-based interface.

Boulder Creek Water Rights. Lead expert in a variety of water rights proceedings for the City of Boulder related to applications, changes, and transfers of agricultural rights in the Boulder Creek basin.

Yampa River Basin Planning Studies. Project manager for comprehensive water supply planning study that included demand forecasting, development of a basin computer model, and evaluation of potential water storage project operations.

Snake River Basin Water Supply Study. Project manager for a comprehensive review of water use in the Snake River basin and computer model evaluation of potential water management strategies, including agricultural water conservation, to enhance anadromous fisheries.

Columbus Ditch Transfer. Performed engineering analysis of the historical use of irrigation rights located on the Blue River, determining the portion of consumptive use made possible by Green Mountain Reservoir releases.

Muddy Creek Water Rights. Analyzed the historical consumptive use of the irrigation water rights associated with the Gary Hill Ranch on Muddy Creek, in support of water rights acquisition associated with the construction of Muddy Creek Reservoir.

Summit County Small Reservoir Study. Project manager for a Blue River basin water management study involving development of a hydrologic model and evaluation of new storage facilities for instream flow maintenance.

Gunnison Basin Planning Study. Project manager for development of a detailed hydrology and water rights model of the 8000 square mile Gunnison River basin as part of a comprehensive river basin planning study.

Windy Gap Delivery Study. Developed detailed computer models of Colorado-Big Thompson Project operations to support analysis of the yields of the Windy Gap Project, which shares common facilities.

Superconducting Super Collider Water Supply. Determined industrial water needs and developed the water supply strategy for a proposed Department of Energy physics research facility.

Boulder Raw Water Master Plan. Prepared a comprehensive report concerning water rights holdings and water supply system operating policies for a Front Range municipality of 100,000 persons.

Standley Lake Pollutant Loading. Developed hydrologic and pollutant loading model of Standley Lake to assess relative effects of non-point sources and a proposed effluent exchange by a major industrial water user.

Pecos River Compact. Consultant to the Special Master of the U.S. Supreme Court on technical issues in a lawsuit between Texas and New Mexico concerning river depletions and water deliveries.

Rocky Ford Ditch Transfer. Performed engineering analyses of historic irrigation practices and Arkansas River depletions associated with a 4100-acre tract in southeastern Colorado.

Buena Vista Water Rights. Analysis of the historic use of irrigation water rights and development of engineering data supporting their transfer to municipal use.

Dillon Clean Lakes Study. Development of a comprehensive hydrologic monitoring network to determine lake inflow patterns and non-point source pollutant loadings from various land uses.

Restoration of West Tenmile Creek. Performed hydrologic and hydraulic analysis and design of comprehensive stream habitat improvements at Copper Mountain ski area.